

4 Model Evaluation and Recommendation Example

4.1 Train and Test Samples

A training sample of 40,589 observations, containing 403 movies and 2,481 users, was used to train all of the recommendation tools. A testing sample of 40,353 observations, containing 403 movies and 2,481 users, was used to evaluate our recommendation tools.

4.2 Model Evaluation Framework

The evaluation framework is based on a testing sample of 40,353 observations, containing 403 movies and 2,481 users . The following table is an example of the evaluation framework:

Recommendation Method 1

Input Movies	Recommended Movie	Average score (Testing sample)
Titanic	The Notebook	4.5 (computed based on people who liked Titanic and reviewed The Notebook)
Watchman	Superman	4.8
*	*	
*	*	
*	*	
Harry Potter	Lord of the Rings	
Average		4.75

This table is created for each method. The first column is all of the possible inputs from which the user can choose their favorite movie. The second column is the movie recommended by Method 1. To explain the third column let’s focus on the first example. If the user chooses Titanic, the recommended movie would be The Notebook. From the test sample we take all the users who liked Titanic and also reviewed The Notebook and compute the average score they gave to The Notebook. Then the average of all of the rows is computed to get an overall score of the recommendation method. We do this for our three recommendation tools and compare.

4.3 Evaluaton Results

Recommendation Method	Average Score
Network	4.31
Biclustering	4.51
Chi-Square	4.46

The Biclustering and Chi-square methods are very close, however the biclustering is a little bit better.

4.4 Recommendation Example

This is an example of what the three methods would recommend if the input movie is “Watchmen movie” which is a movie based on a DC comic.

	recommendation_name	director	actor1	actor2	actor3	review_score	review_num
Network Analysis	Ratatouille	Brad Bird	Brad Garrett	Lou Romano	Patton Oswalt	4.48	162
	Iron Man - Spanish Version	Jon Favreau	Jeff Bridges	Jr. Robert Downey	Clark Gregg	4.47	267
	The Departed (Blu-ray/DVD Bundle)	NA	NA	NA	NA	4.21	289
Biclustering	Sweeney Todd - The Demon Barber of Fleet Street	Tim Burton	Helena Bonham Carter	Johnny Depp	Alan Rickman	4.20	155
	Live Free or Die Hard - Unrated (Two-Disc Special Edition)	Len Wiseman	Bruce Willis	Justin Long	Timothy Olyphant	4.09	170
	Watchmen	Zack Snyder	Malin Akerman	Billy Crudup	Matthew Goode	3.91	178
Chi^2 Analysis	Superman Returns [Blu-ray]	Bryan Singer	Brandon Routh	Kate Bosworth	Kevin Spacey	3.52	261
	V for Vendetta [HD DVD]	James McTeigue	Natalie Portman	Hugo Weaving	Stephen Rea	4.08	218
	Sin City - Unrated (Two-Disc Collector's Edition)	Frank Miller (II)	Jessica Alba	Devon Aoki	Alexis Bledel	4.18	298

There are some similarities between these movies. There are some “superheroes movies” recommended such as “Ironman” and “Superman”. We can also see that some are are action movies like “V for Vendetta”. Many of this movies can also be categorized as “Good vs Bad Guys” movies.